





OWNER:  شرکت سست و سویی توهمه ایران (سهامی خاص)	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT						EPC CONTRACTOR:  Chagalesh-Enerchimi-Steam Joint Venture BUPC-MEG PLANT PROJECT		
	<b>CALCULATION &amp; DATA SHEET OF SAFETY VALVE FOR NITROGEN GAS BOOSTER</b>						 Netherlands		
MC :  شرکت سست و سویی توهمه ایران (سهامی خاص)	Project	Area	Phase	Unit	Dis.	Doc.	Seq.	Contract No : 52-98/445	
Owner Document Number: 17811-52A	BU	20	VD	303	IN	DSH	0015	Rev.:	Page
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## CALCULATION & DATA SHEET OF SAFETY VALVE FOR NITROGEN GAS BOOSTER

01	27/10/2021	<span style="border: 1px solid red; padding: 2px;">Approve For Construction</span> <del>For approval</del>		TvT	KP	LdM	
00	20/09/2021	For approval		TvT	KP	LdM	
<b>Rev.</b>	<b>Date</b>	<b>Purpose of Issue</b>		<b>Prepared</b>	<b>Checked</b>	<b>Approved</b>	<b>AC Code</b>
						<b>Class: 1</b>	<b>Phase: P</b>





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**Notes:**

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GENERAL	1	Tag Number		PSV-10001	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor upstream After-cooler	
	5	Line/equip. No.		2"-NL-1002-539D(IN)	
	6	Design / nozzle type		Safety / Full	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Nitrogen	Dry Gas
	11	Pressure	Norm. Max.	14 Bar(a)	16 Bar(a)
	12	Temperature	Norm. Max.	160°C	170°C
	13	Design	Press. Temp.	21 Bar(a)	200°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
BASIS AND SELECTION	15	Flow		707 Kg/hr / 565 Nm3/hr	
	16	Set Pressure		16 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	28,97 kg/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		18,613	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	300#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
OPTIONS	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
	42				
	43	Lever: Plain or Packed		Plain	
	44	Test Gag		Yes	
CERTIFICATES	45				
	46				
	47				
	48	3.1 Material certificate		Yes	
CALCULATIONS	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
	51	Functional test		Yes	
PURCHASE	52	Sizing calculation		Yes	
	53				
PURCHASE	54				
	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
57					

**NOTES :**

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GENERAL	1	Tag Number		PSV-10002	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor upstream After-cooler	
	5	Line/equip. No.		2"-NL-1003-539D(IN)	
	6	Design / nozzle type		Safety / Full	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Nitrogen	Dry Gas
	11	Pressure	Norm. Max.	23 Bar(a)	25 Bar(a)
	12	Temperature	Norm. Max.	135°C	140°C
	13	Design	Press. Temp.	25 Bar(a)	170°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
BASIS AND SELECTION	15	Flow		707 Kg/hr / 565 Nm3/hr	
	16	Set Pressure		25 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	28,97 kg/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		28,513	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	300#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
OPTIONS	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
	42				
	43	Lever: Plain or Packed		Plain	
	44	Test Gag		Yes	
	45				
	46				
	47				
CERTIFICATES	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
	51	Functional test		Yes	
CALCULATIONS	52	Sizing calculation		Yes	
	53				
	54				
PURCHASE	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
	57				

**NOTES :**

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GENERAL	1	Tag Number		PSV-10003	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor Cooling water outlet	
	5	Line/equip. No.		2"-CWR-1011-501C(N)	
	6	Design / nozzle type		Safety / Full	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Water	Liquid
	11	Pressure	Norm. Max.	2,5 Bar(g)	3 Bar(g)
	12	Temperature	Norm. Max.	45°C	55°C
	13	Design	Press. Temp.	5 Bar(g)	60°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
BASIS AND SELECTION	15	Flow		14,5 m3/hr	
	16	Set Pressure		3,5 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	18,015 g/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		4,863	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	150#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
OPTIONS	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
	42				
	43	Lever: Plain or Packed		N/A	
	44	Test Gag		Yes	
	45				
CERTIFICATES	46				
	47				
	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
CALCULATIONS	50	Leakage test acc to API STD 527		Yes	
	51	Functional test		Yes	
	52	Sizing calculation		Yes	
PURCHASE	53				
	54				
	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
	57				

**NOTES :**

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GENERAL	1	Tag Number	PSV-10001, PSV-10002, PSV-10003	
	2	Service	Pressure Safety Valve	
	3	P&ID No.	17811-03	
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	5			
	6	Calculations	VTA	
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